

Claims

1. A method for the production of a coated cottonseed product, comprising:

coating cottonseed with a coating composition comprising (a) a member selected from the group consisting of water and liquid feed products, (b) a soluble phosphorous source and (c) a metal compound capable of interacting with said soluble phosphorous source to produce a coating on the cottonseed; and

curing the coated cottonseed formed thereby.

2. The method of claim 1, wherein said liquid feed product is a member selected from

10 the group consisting of condensed fermentation solubles, corn steep liquor, distillers solubles yeast paste, liquid whey and molasses.

3. The method of claim 2, wherein said liquid feed product is condensed fermentation solubles and said condensed fermentation solubles are condensed glutamic acid fermentation solubles.

4. The method of claim 1, wherein said soluble phosphorous source is a member selected from the group consisting of phosphoric acid, phosphorous acid, diammonium phosphate, monoammonium phosphate, alkali and alkaline metal phosphates, alkali and alkaline metal phosphonates.

5. The method of claim 4, wherein said soluble phosphorous source is phosphoric acid.

6. The method of claim 1, wherein said metal compound is a member selected from the group consisting of alkaline earth metal compounds and aluminum compounds.

7. The method of claim 6, wherein said metal compound is a member selected from the group consisting of calcium salts and magnesium salts.

25 8. The method of claim 7, wherein said metal compound is a member selected from the group consisting of calcium carbonate, calcium oxide, calcium chloride, calcium sulfate, calcium hydroxide, calcium propionate, calcium acetate, magnesium oxide, magnesium chloride, magnesium sulfate, and magnesium hydroxide.

9. The method of claim 6, wherein said metal compound is aluminum oxide.

30 10. The method of claim 8, wherein said metal compound is calcium carbonate or magnesium oxide.

11. The method of claim 1, wherein said coating composition comprises from 10 to 30 wt% of (a), from 3 to 10 wt% of (b) and from 2 to 8 wt% of (c), based on total weight of the coated cottonseed product.

12. The method of claim 1, wherein said coating composition further comprises one or more additives selected from the group consisting of enzymes, amino acids, water absorbers, vitamins, minerals, direct fed microbials and mold inhibitors.

13. The method of claim 1, wherein said coating step comprises:

coating cottonseed with (c) said metal compound;

forming a liquid solution of (a) said water or liquid feed product and (b) said soluble phosphorous source; and

combining said liquid solution with the cottonseed coated with (c).

14. A coated cottonseed product, comprising:

cottonseed, and a cured coating prepared from a coating composition comprising:

(a) a member selected from the group consisting of water and liquid feed products, (b) a soluble phosphorous source and (c) a metal compound that interacts with said soluble phosphorous source to form a coating on said cottonseed.

15. The product of claim 14, wherein said liquid feed product is a member selected from the group consisting of condensed fermentation solubles, corn steep liquor, distillers solubles yeast paste, liquid whey and molasses.

16. The product of claim 15, wherein said liquid feed product is condensed fermentation solubles and said condensed fermentation solubles are condensed glutamic acid fermentation solubles.

17. The product of claim 14, wherein said soluble phosphorous source is a member selected from the group consisting of phosphoric acid, phosphorous acid, diammonium phosphate, monoammonium phosphate, alkali and alkaline metal phosphates, alkali and alkaline metal phosphonates.

18. The product of claim 17, wherein said soluble phosphorous source is phosphoric acid.

19. The product of claim 14, wherein said metal compound is a member selected from the group consisting of alkaline earth metal compounds and aluminum compounds.

20. The product of claim 19, wherein said metal compound is a member selected from the group consisting of calcium salts and magnesium salts.

21. The product of claim 20, wherein said metal compound is a member selected from the group consisting of calcium carbonate, calcium oxide, calcium chloride, calcium sulfate, calcium hydroxide, calcium propionate, calcium acetate, magnesium oxide, magnesium chloride, magnesium sulfate, and magnesium hydroxide.

5 22. The product of claim 19, wherein said metal compound is aluminum oxide.

23. The product of claim 21, wherein said metal compound is calcium carbonate or magnesium oxide.

10 24. The product of claim 14, wherein said coating composition comprises from 10 to 30 wt% of (a), from 3 to 10 wt% of (b) and from 2 to 8 wt% of (c), based on total weight of the coated cottonseed product.

25. The product of claim 14, wherein said coating composition further comprises one or more additives selected from the group consisting of enzymes, amino acids, water absorbers, vitamins, minerals, direct fed microbials and mold inhibitors.

26. A ruminant feed composition, comprising:

cottonseed, and a cured coating prepared from a coating composition comprising:

(a) a member selected from the group consisting of water and liquid feed products, (b) a soluble phosphorous source and (c) a metal compound that interacts with said soluble phosphorous source to provide a coating on said cottonseed, and

one or more conventional ruminant feed constituents.

27. The composition of claim 26, wherein said liquid feed product is a member selected from the group consisting of condensed fermentation solubles, corn steep liquor, distillers solubles yeast paste, liquid whey and molasses.

28. The composition of claim 27, wherein said liquid feed product is condensed fermentation solubles and said condensed fermentation solubles are condensed glutamic acid fermentation solubles.

29. The composition of claim 26, wherein said soluble phosphorous source is a member selected from the group consisting of phosphoric acid, phosphorous acid, diammonium phosphate, monoammonium phosphate, alkali and alkaline metal phosphates, alkali and alkaline metal phosphonates.

30 30. The composition of claim 29, wherein said soluble phosphorous source is phosphoric acid.

31. The composition of claim 26, wherein said metal compound is a member selected from the group consisting of alkaline earth metal compounds and aluminum compounds.

32. The composition of claim 31, wherein said metal compound is a member selected from the group consisting of calcium salts and magnesium salts.

5 33. The composition of claim 32, wherein said metal compound is a member selected from the group consisting of calcium carbonate, calcium oxide, calcium chloride, calcium sulfate, calcium hydroxide, calcium propionate, calcium acetate, magnesium oxide, magnesium chloride, magnesium sulfate, and magnesium hydroxide.

34. The composition of claim 31, wherein said metal compound is aluminum oxide.

10 35. The composition of claim 33, wherein said metal compound is calcium carbonate or magnesium oxide.

36. The composition of claim 26, wherein said coating composition comprises from 10 to 30 wt% of (a), from 3 to 10 wt% of (b) and from 2 to 8 wt% of (c), based on total weight of the coated cottonseed product.

15 37. The composition of claim 26, wherein said coating composition further comprises one or more additives selected from the group consisting of enzymes, amino acids, water absorbers, vitamins, minerals, direct fed microbials and mold inhibitors.

38. A method for the treatment, prevention or both, of urinary calculi in a cow, comprising:

20 administering to a cow in need thereof, a ruminant feed composition comprising: cottonseed, and a cured coating prepared from a coating composition comprising:

(a) condensed glutamic acid fermentation solubles, (b) a soluble phosphorous source and (c) a metal compound that interacts with said soluble phosphorous source to provide a coating on said cottonseed, and

25 one or more conventional ruminant feed constituents.

39. The method of claim 38, wherein said soluble phosphorous source is a member selected from the group consisting of phosphoric acid, phosphorous acid, diammonium phosphate, monoammonium phosphate, alkali and alkaline metal phosphates, alkali and alkaline metal phosphonates.

30 40. The method of claim 39, wherein said soluble phosphorous source is phosphoric acid.

41. The method of claim 38, wherein said metal compound is a member selected from the group consisting of alkaline earth metal compounds and aluminum compounds.

42. The method of claim 41, wherein said metal compound is a member selected from the group consisting of calcium salts and magnesium salts.

5 43. The method of claim 42, wherein said metal compound is a member selected from the group consisting of calcium carbonate, calcium oxide, calcium chloride, calcium sulfate, calcium hydroxide, calcium propionate, calcium acetate, magnesium oxide, magnesium chloride, magnesium sulfate, and magnesium hydroxide.

44. The method of claim 41, wherein said metal compound is aluminum oxide.

10 45. The method of claim 43, wherein said metal compound is calcium carbonate or magnesium oxide.

46. The method of claim 38, wherein said coating composition comprises from 10 to 30 wt% of (a), from 3 to 10 wt% of (b) and from 2 to 8 wt% of (c), based on total weight of the coated cottonseed product.

15 47. The method of claim 38, wherein said coating composition further comprises one or more additives selected from the group consisting of enzymes, amino acids, water absorbers, vitamins, minerals, direct fed microbials and mold inhibitors.

48. A method for the prevention of milk fever in a cow, comprising:

administering to a cow in need thereof, a ruminant feed composition comprising: cottonseed, and a cured coating prepared from a coating composition comprising:

20 (a) condensed glutamic acid fermentation solubles, (b) a soluble phosphorous source and (c) a metal compound that interacts with said soluble phosphorous source to provide a coating on said cottonseed, and

one or more conventional ruminant feed constituents.

25 49. The method of claim 48, wherein said soluble phosphorous source is a member selected from the group consisting of phosphoric acid, phosphorous acid, diammonium phosphate, monoammonium phosphate, alkali and alkaline metal phosphates, alkali and alkaline metal phosphonates.

50. The method of claim 49, wherein said soluble phosphorous source is phosphoric acid.

30 51. The method of claim 48, wherein said metal compound is a member selected from the group consisting of alkaline earth metal compounds and aluminum compounds.

52. The method of claim 51, wherein said metal compound is a member selected from the group consisting of calcium salts and magnesium salts.

53. The method of claim 52, wherein said metal compound is a member selected from the group consisting of calcium carbonate, calcium oxide, calcium chloride, calcium sulfate, calcium hydroxide, calcium propionate, calcium acetate, magnesium oxide, magnesium chloride, magnesium sulfate, and magnesium hydroxide.

54. The method of claim 51, wherein said metal compound is aluminum oxide.

55. The method of claim 53, wherein said metal compound is calcium carbonate or magnesium oxide.

10 56. The method of claim 48, wherein said coating composition comprises from 10 to 30 wt% of (a), from 3 to 10 wt% of (b) and from 2 to 8 wt% of (c), based on total weight of the coated cottonseed product.

15 57. The method of claim 48, wherein said coating composition further comprises one or more additives selected from the group consisting of enzymes, amino acids, water absorbers, vitamins, minerals, direct fed microbials and mold inhibitors.